

Homework #5

First & Last Name: _____ Class: _____

For homework to be graded, it must be *fully completed*. This means you must **show your work**.

- Without a calculator, evaluate and write the corresponding exponential expression:
a. $\log_2(32)$ b. $\log_5(25)$ c. $\log(1000)$ d. $\log_3(27)$ e. $\log_{100}(100)$
- [Challenge] Without a calculator, evaluate and write the corresponding exponential expression:
a. $\log_2(1/2)$ b. $\log_{1/2}(2)$ c. $\log(\log(10^{10}))$ d. $\log_{1/3}(1/3)$ e. $\log_5(1/625)$
- If the equation $Y = 7.3 \cdot e^h$ models the growth of yeast (in milligrams) as a function of the hours elapsed, h , when will there be 20 milligrams of yeast?
- [Challenge] Does the equation $f(x) = 10 \cdot (0.8)^x$ represent exponential growth or decay? Explain.
- What magnitude of earthquake, on the Richter Scale, is 300 times less than a magnitude 4.7 quake?
- Write the exact expression for the radius of a sphere that has a volume of 1 cubic foot.
- For the following piecewise function, calculate $f(-2)$, $f(0)$, and $f(2)$.
$$f(x) = \begin{cases} 2 - 5x & \text{for } x \leq 1 \\ x^3 & \text{for } x > 1 \end{cases}$$
- [Challenge] For the above piecewise function, solve $f(x) = 1$.
- [Challenge] What is the domain of the function
 - $\log(x - 1)$?
 - $\log(x + 1)$?
 - $\log(2x - 3)$?
- The speed of an object, in feet per second, is governed by the equation $v(t) = 4t + 7$. Sketch a graph of this function. Shade the region representing the distance the object travelled in the interval $0 \leq t \leq 5$. Determine the exact distance the object travelled in that interval.